Vacuum generators OVEM

New
OVEM-...-LK

Vacuum generators OVEM

Key features

At a glance

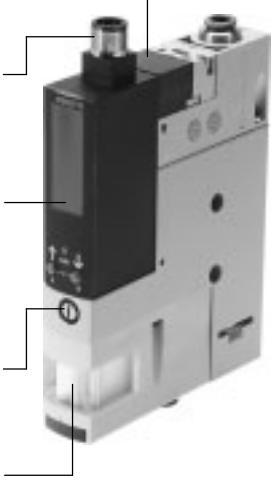
Rapid purging of vacuum for safe placement of the workpiece by means of an integrated solenoid valve for controlling the ejector pulse

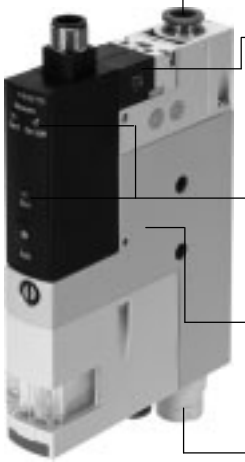
Central electrical connection via an M12 plug

OVEM-...-2P/2N/PU/NU/PI/NI/LK
Monitoring and visualisation of the vacuum pressure by means of a vacuum sensor with LCD display (bar)
OVEM-...-LK
Vacuum sensor with IO-Link

Adjustment of the ejector pulse via a flow control screw

Prevention of contamination of the vacuum generator by means of an integrated filter





Quick and secure installation thanks to QS fitting

Fast vacuum build-up by means of an integrated solenoid valve for controlling the compressed air supply

OVEM-...-1P/1N
Monitoring of the vacuum pressure and status displays for switching output and solenoid valves by means of a vacuum sensor with LED display

Prevention of pressure drops by means of an integrated check valve

Maintenance-free operation and reduced noise level through an integrated, open silencer

The modular vacuum generator series

The modular vacuum generator series OVEM offers a wide range of individually selectable functions, making it possible to find a solution for the most varied of applications.

Functions	Values
Laval nozzle	0.45 mm
	0.7 mm
	0.95 mm
	1.4 mm
	2.0 mm[1]
Vacuum generator characteristics	High vacuum
	High suction rate
Housing size	20 mm, metric version, display in bar
	20 mm, NPT version, display in inchHg[2]
Pneumatic connections	QS fittings, with or without open silencer
	QS fittings (inch), with or without open silencer[2]
	G female thread, with or without open silencer
	NPT female thread, with or without open silencer[2]
	Prepared for supply manifold
Normal position of the vacuum generator	Normally open, with or without ejector pulse
	Normally closed, with or without ejector pulse
Electrical connection	Plug M12 (5-pin)
Vacuum sensor	Without vacuum sensor
	Switching output 1x PNP or 1x NPN[3]
	Switching output 2x PNP or 2x NPN[4]
	Switching output 1x PNP or 1x NPN and analogue output[4]
	IO-Link
Alternative vacuum display	InchHg[4]
	InchH2O[2] [4]
	Bar[2] [4]

1) Restricted choice of functions
2) Product documentation ➔ Internet: ovem-npt
3) Vacuum sensor with LED display
4) Vacuum sensor with LCD display

New
OVEM-...-LK

Vacuum generators OVEM

Key features

The innovative vacuum generator

Economical

- Short switching times thanks to integrated solenoid valves
  - Vacuum on/off
  - Ejector pulse
- Quick, precise and safe placement of the workpiece by means of the ejector pulse
- Cost saving through preventive maintenance/service thanks to maintenance indicator
- Cost saving through integrated air-saving function
- Powerful supply of multiple vacuum generators via a common supply manifold (➔ page 19)
- Low-cost variants with one switching output (OVEM-...-1P/1N)

Easy to use

- Simple installation via M12 plugs and QS fittings
- Simple mounting via screws
- All control elements are on one side
- Quiet operation thanks to integrated silencers
- Vacuum sensor with LCD display (OVEM-...-2P/2N/PU/NU/PI/NI/LK)
  - Vacuum is displayed numerically and as a bar chart
  - Important parameters and diagnostic information are displayed

Reliable

- Permanent monitoring of the entire vacuum system via a vacuum sensor to reduce downtimes (condition monitoring)
- Prevention of pressure drop by means of an integrated air-saving function in conjunction with an integrated check valve

Space-optimised

All functions are compactly integrated in one unit.

- No protruding elements such as valves or vacuum sensor
- Space-optimised installation is possible as all the control elements can be accessed from one side

Easy to maintain

- Integrated filter with inspection window for maintenance indication
- Reduced contamination of the vacuum generator thanks to an open silencer

Choice of mounting types

- Direct mounting or via mounting bracket
- Straightforward mounting on H-rail via accessories
- Interlocking of multiple vacuum generators on a common supply manifold (➔ page 19)

Operating principle of OVEM

Vacuum on/off

The compressed air supply is controlled by an integrated solenoid valve. The solenoid valve can be supplied with two different switching functions, NC and NO.

- NC - normally closed:
  The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve has been switched.
- NO - normally open:
  The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve is in the normal position.

Vacuum sensor

The set or taught-in reference value for the generated vacuum is monitored via an integrated vacuum sensor. If the reference value is reached or if it is not reached due to malfunctions (e.g. leakages, dropped workpiece), the vacuum sensor emits an electrical signal.

Ejector pulse

After the vacuum is switched off, an ejector pulse is activated and generated by means of a second integrated solenoid valve to release the workpiece safely from the suction cup and to purge the vacuum quickly.

Connection to higher-level systems and configuration of the switching outputs

OVEM-...-1P/1N

- Switching inputs for actuating the solenoid valves for vacuum generation and ejector pulse
- One switching output for supplying a control signal
  - Configured as an N/O contact
  - Switching function configured as a threshold value comparator

OVEM-...-2P/2N/PU/NU/PI/NI

- One digital switching input for actuating the solenoid valves
- Two digital switching outputs or one digital switching output and one analogue output for supplying control signals
  - Switching outputs can be configured as N/C or N/O contacts
  - Switching function of the outputs can be configured as a threshold value or window comparator
- If there are two switching outputs, these can be configured independently of each other. This enables tasks to be performed in parallel with one vacuum generator, reducing the time needed for sorting good and reject parts, for example.

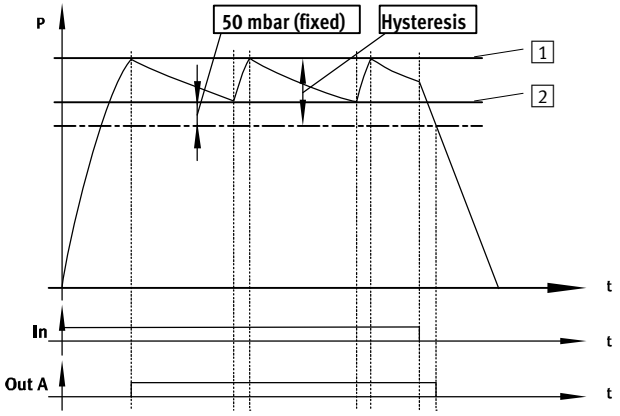
OVEM-...-LK

- Digital setpoint and actual value transfer for simple parameterisation and diagnostic feedback. Communication takes place in IO-Link mode with an IO-Link master.
- SIO mode is supported. In the case of this local configuration using the operating buttons on the vacuum sensor, the OVEM takes on the function of an OVEM-...-2P.

Vacuum generators OVEM

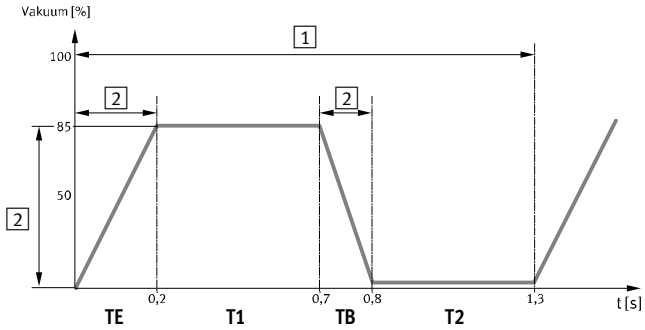
Key features

OVEM-...-2P/2N/PU/NU/PI/NI/LK – Air-saving function LS (-CE, -OE)



If the desired threshold value 1 for the vacuum is reached, vacuum generation is automatically switched off. A check valve prevents a decrease of the vacuum.
Nonetheless, leakage (e.g. due to rough workpiece surfaces) will slowly reduce the vacuum. If the vacuum drops below the threshold value 2, vacuum generation is switched on automatically. Vacuum is generated until the set threshold value 1 is reached again.

OVEM-...-2P/2N/PU/NU/PI/NI/LK – Condition monitoring and diagnostics



1 Cycle time
2 Monitoring
TE Evacuation time
T1 Transport time
TB Air supply time
T2 Return time

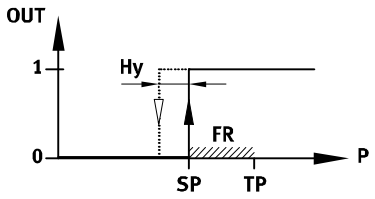
The main operating parameters
- Vacuum
- Evacuation time
- Air supply time

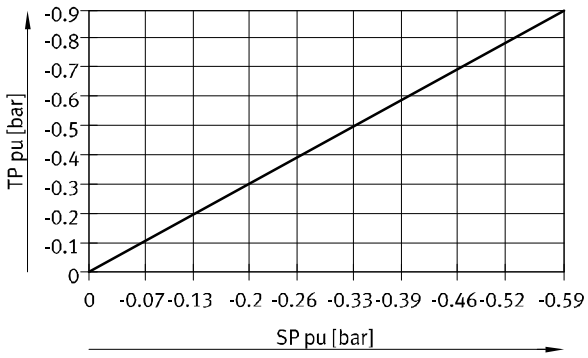
are continuously measured in the vacuum generator and compared with the individually set reference values (condition monitoring). If deviations in the reference values occur, these will be determined by the vacuum generator and shown on the display (diagnostics).

In addition, in the case of an OVEM with two switching outputs (-2P, -2N, -LK in SIO mode) diagnostic messages can also be transmitted by the switching output Out B.

This permits preventative action
- in order to prevent machine failure or downtime, for example, through timely maintenance
- and to ensure process reliability (adherence to the cycle time).

OVEM-...-1P/1N – From the teach-in point to the switching point





TP Teach-in point
SP Switching point
Hy Hysteresis
FR Functional reserve

The switching point is determined from the teach pressure and the functional reserve.
A function reserve (35% of the teach pressure) is deducted from the teach pressure (SP = TP – 0.35*TP).

For example, with a teach pressure of –0.5 bar, a switching point of –0.33 bar is set.
The hysteresis has a fixed value.

Vacuum generators OVEM

Peripherals overview

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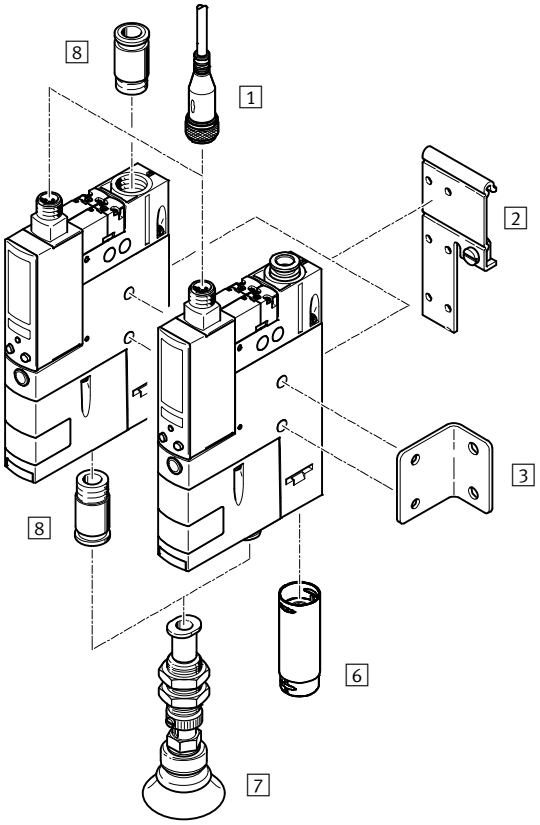
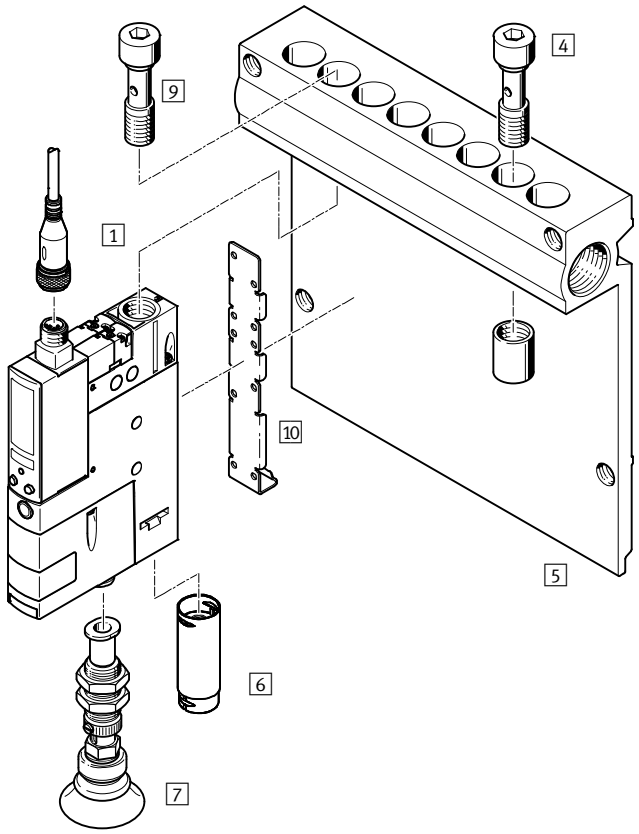
OVEM-...-QS/QO/GN/GO-...



OVEM-...-PL/PO-...[1)]



1) Hollow bolt 9 and mounting bracket 10 are included in the scope of delivery of the OVEM-...-PL/PO-....

Mounting components and accessories		OVEM-...-QS/QO/GN/GO-...				OVEM-...-PL/PO-...		→ Page/Internet
		QS	QO	GN	GO	PL	PO	
1	Connecting cable NEBU-M12	■				■		21
2	H-rail mounting OABM-H	■				–		20
3	Mounting bracket HRM-1	■				–		21
4	Blanking plug OASC-G1-P	–				■		20
5	Common supply OABM-P...	–				■		19
6	Silencer extension UOMS-¼	–	■2)	–	■2)	–	■2)	21
7	Suction grippers ESG	■				■		esg
8	Push-in fitting QS	–		■		–		quick star
–	Suction cup holder ESH	■				■		esh
–	Suction cups with connection attachments ESS	■				■		ess

2) Silencer extension UOMN-¼ 6 is included in the scope of delivery of the OVEM-20.

Vacuum generators OVEM

Type codes

OVEM	–	10	–	H	–	B	–	QO	–	CE	–	N	–	2P	–	

Type	
OVEM	Vacuum generator

Nominal size of laval nozzle [mm]	
05	0.45
07	0.7
10	0.95
14	1.4
20	2.0

Ejector characteristic	
H	High vacuum
L	High suction rate

Housing width	
B	Grid dimension 20 mm

Pneumatic connections	
QS	P-V-R with QS fitting
QO	P-V with QS fitting, R with open silencer
GN	P-V-R with female thread
GO	P-V with female thread, R with open silencer
PL	Common supply manifold prepared, V-R with QS fitting
PO	Prepared for common supply manifold, V with QS fitting, R with open silencer

Normal position of the vacuum generator	
ON	NO, normally open (vacuum generation)
OE	NO, normally open (vacuum generation) with ejector pulse
CN	NC, normally closed (no vacuum generation)
CE	NC, normally closed (no vacuum generation) with ejector pulse

Electrical connection	
N	Plug M12 (5-pin)

Vacuum sensor	
–	Without vacuum sensor
1P	1 switching output PNP
1N	1 switching output NPN
2P	2 switching outputs PNP
2N	2 switching outputs NPN
PU	1 switching output PNP, 1 analogue output 0 ... 10 V
PI	1 switching output PNP, 1 analogue output 4 ... 20 mA
NU	1 switching output NPN, 1 analogue output 0 ... 10 V
NI	1 switching output NPN, 1 analogue output 4 ... 20 mA
LK	IO-Link

Vacuum display	
–	Bar
H	InchHg

Vacuum generators OVEM

Technical data

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Function

NC, normally closed:
- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

NO, normally open:
- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

Temperature range
0 ... +50 °C

Operating pressure
2 ... 8 bar

OVEM-...-2P/2N/PU/NU/PI/NI/LK

OVEM-...-1P/1N

General technical data						
Type		OVEM-05	OVEM-07	OVEM-10	OVEM-14	OVEM-20
Nominal width of laval nozzle	[mm]	0.45	0.7	0.95	1.4	2.0
Grid dimension	[mm]	20				
Grade of filtration	[µm]	40				
Mounting position		Any				
Type of mounting		With through-hole				
		With female thread				
		Via accessories				
Pneumatic connection 1 (P)		➔ Dimensions on page 13				
Vacuum port (V)		➔ Dimensions on page 13				
Pneumatic connection 3 (R)		➔ Dimensions on page 13				

Technical data – Design			
Type		OVEM-05/07/10/14/20-...-QO/PO/GO	OVEM-05/07/10/14/20-...-QS/GN/PL
Design		Modular	
Ejector characteristic		High vacuum/standard H	
		High suction rate/standard L	
Silencer design		Open	–
Integrated function	ON/CN	Electric on-off valve	Electric on-off valve
		Vacuum sensor[1]	Vacuum sensor[1]
		Filter	Filter
		Open silencer	–
	OE/CE	Electric on-off valve	Electric on-off valve
		Ejector pulse, electrical	Ejector pulse, electrical
		Flow control	Flow control
		Vacuum sensor[1]	Vacuum sensor[1]
		Air-saving function, electrical[2]	Air-saving function, electrical[2]
		Non-return valve	Non-return valve
		Filter	Filter
		Open silencer	–
Valve function	ON/OE	Open	
	CN/CE	Closed	
Manual override		Non-detenting	
		Additionally via control buttons[2]	

1) Only with OVEM-...-2P/2N/PU/NU/PI/NI/1P/1N/LK
2) Only possible with OVEM-...-2P/2N/PU/NU/PI/NI/LK

Vacuum generators OVEM

Technical data

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Operating and environmental conditions			
Type		OVEM-05/07/10/14/20-...-QO/PO/GO	OVEM-05/07/10/14/20-...-QS/GN/PL
Operating pressure	[bar]	2 ... 8	2 ... 6
Nominal operating pressure	[bar]	6	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Lubricated operation not possible	
Ambient temperature	[°C]	0 ... +50	
Temperature of medium	[°C]	0 ... +50	
Relative air humidity	[%]	5 ... 85	
Degree of contamination		3	
Corrosion resistance class CRC[1)]		2	
CE marking (see declaration of conformity)		To EU EMC Directive[2)]	
Approval certificate		c UL us listed (OL) (excluding OVEM-...-LK)	
		RCM mark	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Performance data – High vacuum																					
Type		OVEM-05				OVEM-07				OVEM-10				OVEM-14				OVEM-20			
Normal position of the vacuum generator		ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE
Max. vacuum	[%]	93																			
Operating pressure for max. vacuum	[bar]	5.1				4.1				3.5				3.6				5.3			
Max. suction rate with respect to atmosphere	[l/min]	6				16				19.5				50.5				86.5			
Suction rate at p_1 = 6 bar	[l/min]	5.9				15.1				18.6				46				80.5			
Air supply time[1)] for 1 l volume, at p_1 = 6 bar	[s]	4.8	2	4.8	2	1.9	0.4	1.9	0.4	1.2	0.2	1.2	0.2	0.6	0.2	0.6	0.2	0.4	0.2	0.4	0.2
Noise level at p_1 = 6 bar	[db(A)]	51				58				73				77				74			

1) Time required to reduce vacuum to –0.05 bar.

Performance data – High suction rate																	
Type		OVEM-05				OVEM-07				OVEM-10				OVEM-14			
Normal position of the vacuum generator		ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE
Max. suction rate with respect to atmosphere	[l/min]	13				31.5				45				92			
Suction rate at p_1 = 6 bar	[l/min]	12.8				31.5				45.1				88.7			
Air supply time[1)] for 1 l volume, at p_1 = 6 bar	[s]	2	1.3	2	1.3	1	0.2	1	0.2	0.8	0.2	0.8	0.2	0.4	0.2	0.4	0.2
Noise level at p_1 = 6 bar	[db(A)]	45				53				64				70			

1) Time required to reduce vacuum to –0.05 bar.

Vacuum generators OVEM

Technical data

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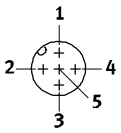
Technical data – Electrical connection					
Type		Without vacuum sensor	With vacuum sensor		
			OVEM-...-2P/2N	OVEM-...-PU/NU/PI/NI/1P/1N	OVEM-...-LK
Electrical connection		Plug connector M12x1, 5-pin			
Standard switching input		IEC 61131-2			
Operating voltage range	[V DC]	20.4 ... 27.6			
Duty cycle	[%]	100			
Coil characteristics 24 V DC	[W]	Low-current phase: 0.3			
		High-current phase: 2.55			
Max. current consumption	[mA]	30	270	180	150 (270 in SIO mode)
Insulation voltage	[V]	50			
Surge resistance	[kV]	0.8			
Protection against incorrect polarity		For all electrical connections			
Degree of protection		IP65			
Protection class		III			

Pin allocation		
Plug connector M12x1, 5-pin	Pin	Meaning
	OVEM without vacuum sensor	
	1	Supply voltage +24 V DC
	2	Switching input for vacuum ON/OFF
	3	0 V
	4	No function
	5	Switching input for ejector pulse ON/OFF
	OVEM-...-2P/2N/PU/NU/PI/NI	
	1	Supply voltage +24 V DC
	2	Switching output Out B (function depending on variant)
	3	0 V
	4	Switching output Out A (switching output for vacuum sensor)
	5	Switching input In (vacuum ON/OFF and ejector pulse)
	OVEM-...-1P/1N	
	1	Supply voltage +24 V DC
	2	Switching input for vacuum ON/OFF
	3	0 V
	4	Switching output Out A (switching output for vacuum sensor)
	5	Switching input for ejector pulse ON/OFF
	OVEM-...-LK	
	1	Supply voltage +24 V DC
	2	Switching output Out B (function depending on variant)
	3	0 V
	4	IO-Link communication or switching output Out A (switching output for vacuum sensor)[1)]
	5	Not assigned, or switching input In (vacuum ON/OFF and ejector pulse)[2)]

1) After a fallback or in SIO mode, this pin has the configuration of a digital switching output.
2) This pin is not assigned in IO-Link mode. After a fallback or in SIO mode, this pin has the configuration of a digital input.

Vacuum generators OVEM

Technical data

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Technical data – Vacuum sensor										
Vacuum sensor		2P	2N	PU	NU	PI	NI	LK	1P	1N
Mechanical										
Measured variable		Relative pressure								
Measuring principle		Piezoresistive								
Pressure measuring range	[bar]	–1 ... 0								
Accuracy FS[1]	[%]	±3							±0.5	
Reproducibility switching value FS[1]	[%]	0.6							0.6	
Setting options		Via display and keys							Teach-in	
		–						IO-Link	–	
Threshold value setting range	[bar]	–0.999 ... 0							–1 ... 0	
Hysteresis setting range	[bar]	–0.9 ... 0							–	
Setting range duration, ejector pulse	[ms]	20 ... 9999 (OVEM-05)						–	–	
		40 ... 9999 (OVEM-07/10/14/20)						40 ... 9999	–	
Display type		4-character alphanumeric, backlit LCD							LED	
Displayable units	–	Bar							–	
	H	InchHg							–	
Indicating range	[bar]	–0.999 ... 0							–	
	[inchHg]	–29.5 ... 0							–	
Switching status indication		Opto-electrical							Opto-electrical	
Switching position indication		LCD							LED	
Protection against tampering		–						Electronic locking	–	
Electric										
Switching output		2x PNP	2x NPN	1x PNP	1x NPN	1x PNP	1x NPN	2x PNP	1x PNP	1x NPN
Switching element function		N/O contact								
		N/C contact							–	
Switching function		Window comparator							–	
		Threshold value comparator[2]								
Fixed hysteresis	[mbar]	–							20	
Max. output current	[mA]	100								
Idle current	[mA]	< 70							< 80	
Residual current	[mA]	0.1								
Voltage drop	[V]	≤ 1.5						≤ 1.8	≤ 1.5	
Inductive protective circuit		Adapted to MZ, MY, ME coils						–	Adapted to MZ, MY, ME coils	
Analogue output	[V]	–		0 ... 10		–		–	–	
	[mA]	–		–		4 ... 20		–	–	
Permitted load resistance (analogue output)	[Ohm]	–		Min. 2000		Max. 500		–	–	
Accuracy of analogue output FS[1]	[%]	–		4					–	
Protection against short circuit		Yes								
Overload protection		Yes								

1) % FS = % of measuring range final value (full scale)
2) OVEM-...-1P/1N threshold value with fixed hysteresis

Vacuum generators OVEM

Technical data

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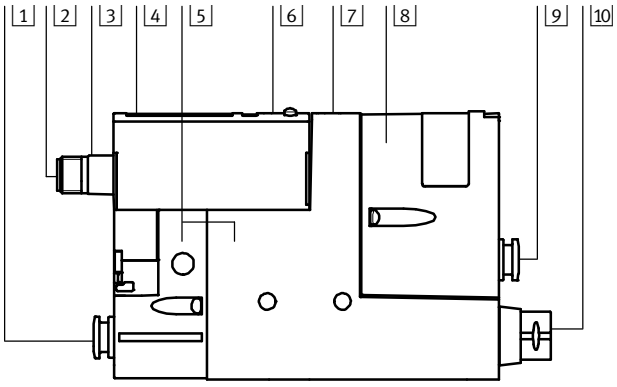
Technical data – IO-Link					
Type		OVEM-...-H-...-OE-N-LK	OVEM-...-L-...-OE-N-LK	OVEM-...-H-...-CE-N-LK	OVEM-...-L-...-CE-N-LK
Protocol version		Device V 1.1			
Profile		Smart sensor profile			
Function classes		Binary data channel (BDC)			
		Diagnostics			
		Identification			
		Process data variable (PDV)			
		Teach channel			
Communication mode		COM2 (38.4 kBaud)			
Port class		A			
Process data width OUT		1 bytes			
Process data content OUT		1 bit (ejector pulse)			
		1 bit (vacuum ON/OFF)			
Process data width IN		Parameterisable 8 or 16 bytes			
Process data content IN		14 bit PDV (pressure reading)			
		2 bit BDC (pressure monitoring)			
Minimum cycle time	[ms]	3.5			
Data memory required		0.5 KB			
Device ID		0x00003C	0x00003D	0x00003E	0x00003F

Materials

Sectional view



OVEM			2P/2N/PU/NU/PI/NI/LK	1P/1N
1	Fitting	QS/QO	Nickel-plated brass	
	Connecting thread	GN/GO	Anodised wrought aluminium alloy	
2	Pin contacts		Gold-plated brass	
3	Plug housing		Nickel-plated brass	
4	Inspection window		PA	–
5	Housing		Die-cast aluminium, reinforced PA	
6	Key pad		TPE-U	Reinforced PA
7	Regulating screw	CE/OE	Steel	
8	Filter housing		Reinforced PA	
9	Fitting	QS/QO/PL/PO	Nickel-plated brass	
	Connecting thread	GN/GO	Anodised wrought aluminium alloy	
10	Silencer	QO/GO/PO	Wrought aluminium alloy, PU foam	
	Fitting	QS/QO/PL/PO	Nickel-plated brass	
		GN/GO	Anodised wrought aluminium alloy	
–	Screws		Steel	
–	Pins		Steel	
–	Jet nozzle		Wrought aluminium alloy	
–	Collector nozzle		POM	
–	Filter		Fabric, PA, sintered steel	
–	Seals		NBR	
–	Hollow bolt	PL/PO	Wrought aluminium alloy	
–	Mounting bracket	PL/PO	Stainless steel	
Note on materials			RoHS compliant	
		QO/GO/PO	Contains paint-wetting impairment substances	

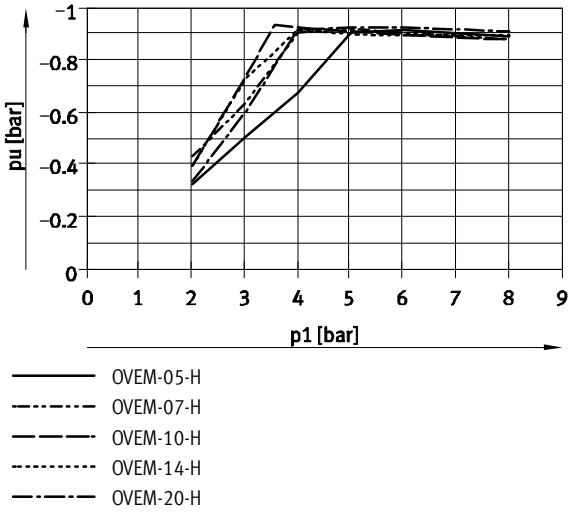
Vacuum generators OVEM

Technical data

FESTO

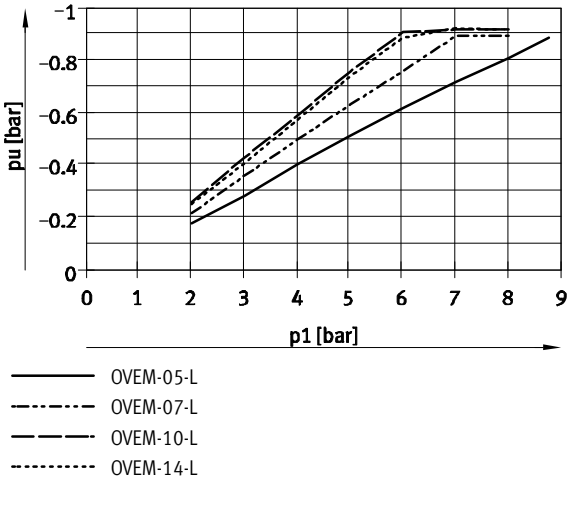
Vacuum p_u as a function of operating pressure p_1

High vacuum



OVEM-05-H
OVEM-07-H
OVEM-10-H
OVEM-14-H
OVEM-20-H

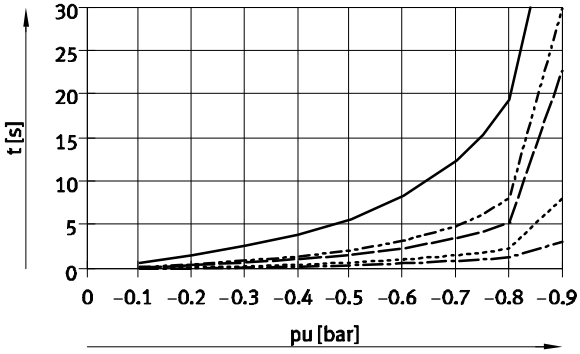
High suction rate



OVEM-05-L
OVEM-07-L
OVEM-10-L
OVEM-14-L

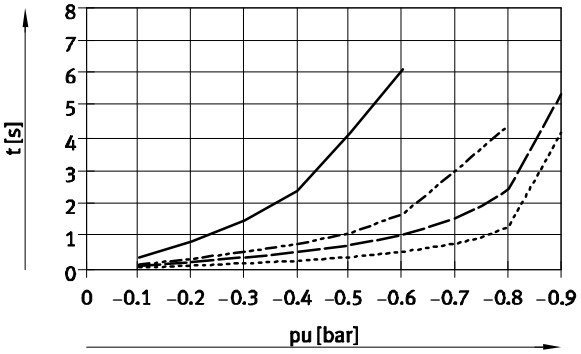
Evacuation time t as a function of vacuum p_u for 1 l volume at 6 bar operating pressure

High vacuum



OVEM-05-H
OVEM-07-H
OVEM-10-H
OVEM-14-H
OVEM-20-H

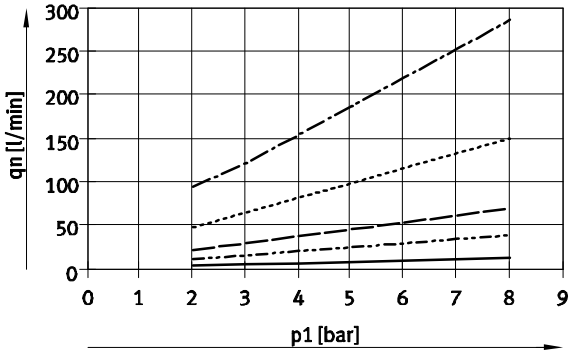
High suction rate



OVEM-05-L
OVEM-07-L
OVEM-10-L
OVEM-14-L

Air consumption q_n as a function of operating pressure p_1

High vacuum/high suction rate



OVEM-05
OVEM-07
OVEM-10
OVEM-14
OVEM-20

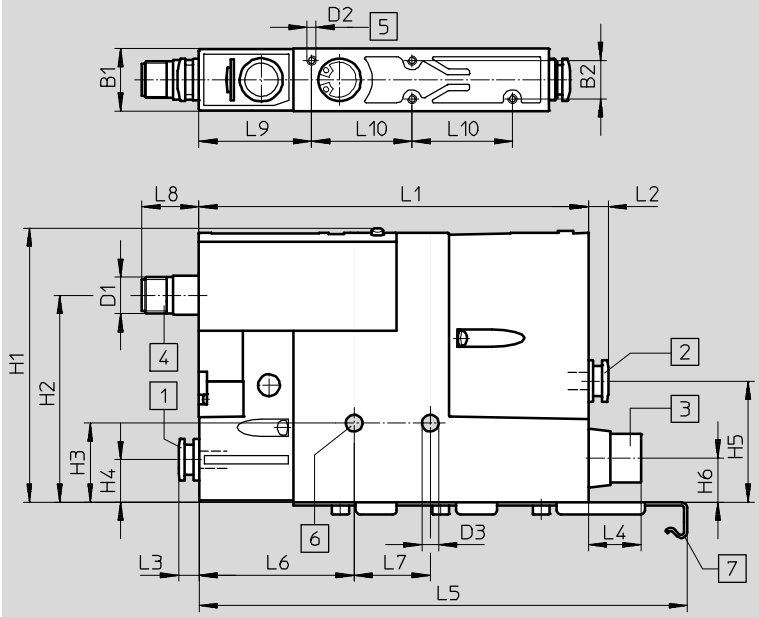
Vacuum generators OVEM

Technical data

FESTO

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-05



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3
Max. tightening torque 0.8 Nm
6 Mounting hole
Max. tightening torque 2.5 Nm
7 Mounting bracket only provided for OVEM-...-PL/PO

Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-05-...-QS-...	QS-6	QS-6	QS-8	M12x1	M3	5.5	20.5	12.6	90	68	26	14.5
OVEM-05-...-QO-...			SD[2]									
OVEM-05-...-PL-...	(G¼)[1]	QS-6	QS-8									
OVEM-05-...-PO-...			SD[2]									
OVEM-05-...-GN-...	G⅛	G⅛	G⅛									
OVEM-05-...-GO-...			SD[2]									

Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
OVEM-05-...-QS-...	40	14.5	115	6.5	6.5	12	–	51	25	18	37	33
OVEM-05-...-QO-...						–						
OVEM-05-...-PL-...					–	12	160.5					
OVEM-05-...-PO-...						–						
OVEM-05-...-GN-...				8.2	8.2	8.2	–					
OVEM-05-...-GO-...						–						

1) Thread for mounting on the common supply manifold ➔ 19
2) SD = Silencer

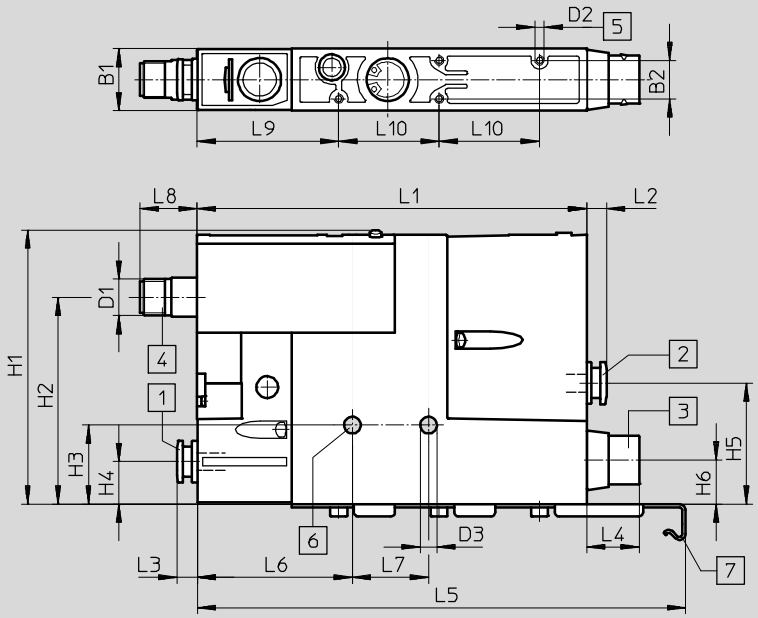
Vacuum generators OVEM

Technical data

FESTO

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-07/10



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3
Max. tightening torque 0.8 Nm
6 Mounting hole
Max. tightening torque 2.5 Nm
7 Mounting bracket only provided for OVEM-...-PL/PO

Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-07/10-...-QS-...	QS-8	QS-8	QS-8	M12x1	M3	5.5	20.5	12.6	90	68	26	14.5
OVEM-07/10-...-QO-...			SD[2]									
OVEM-07/10-...-PL-...	(G¼)[1]	QS-8	QS-8									
OVEM-07/10-...-PO-...			SD[2]									
OVEM-07/10-...-GN-...	G¼	G¼	G⅜									
OVEM-07/10-...-GO-...			SD[2]									

Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
OVEM-07/10-...-QS-...	40	14.5	128	6.5	6.5	12	–	51	25	18	46.5	33
OVEM-07/10-...-QO-...						17.3						
OVEM-07/10-...-PL-...					–	12	160.5					
OVEM-07/10-...-PO-...						17.3						
OVEM-07/10-...-GN-...				17.2	17.2	–	–					
OVEM-07/10-...-GO-...						17.3						

1) Thread for mounting on the common supply manifold ➔ 19
2) SD = Silencer

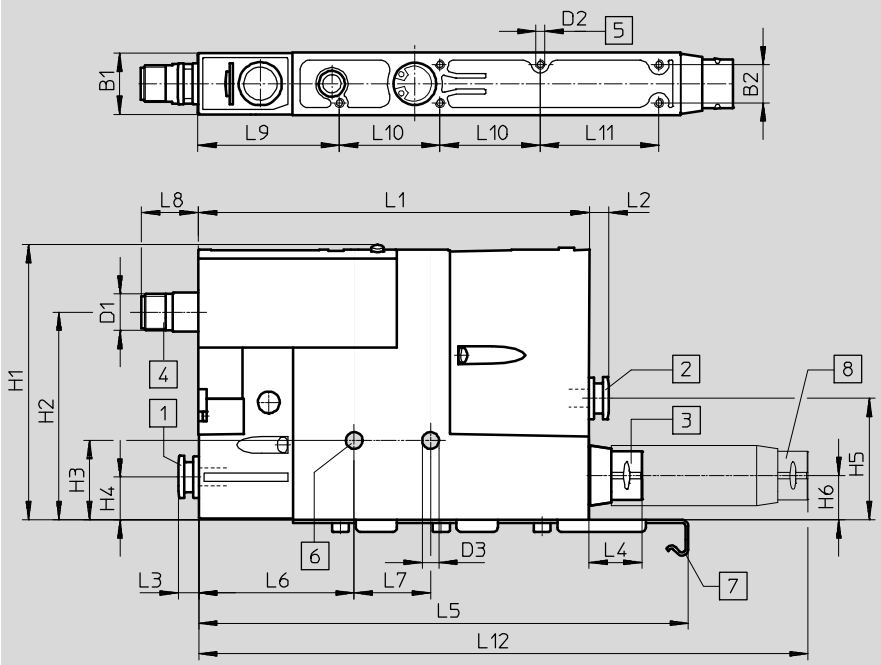
Vacuum generators OVEM

Technical data

FESTO

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-14/20



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3
Max. tightening torque 0.8 Nm
6 Mounting hole
Max. tightening torque 2.5 Nm
7 Mounting bracket only provided for OVEM-...-PL/PO
8 Silencer extension (included in the scope of delivery for OVEM-20)

Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-14/20-...-QS-...	QS-8	QS-8	QS-8	M12x1	M3	4.3	20.5	12.6	90	68	25	14.5
OVEM-14/20-...-QO-...			SD[2]									
OVEM-14/20-...-PL-...	(G¼)[1]	QS-8	QS-8									
OVEM-14/20-...-PO-...			SD[2]									
OVEM-14/20-...-GN-...	G¼	G¼	G⅜									
OVEM-14/20-...-GO-...			SD[2]									

Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
OVEM-14/20-...-QS-...	40	14.5	158	6.5	6.5	12	–	57	25	18	46.5	33	39	–
OVEM-14/20-...-QO-...						17.3								~230
OVEM-14/20-...-PL-...					–	12	160.5							–
OVEM-14/20-...-PO-...						17.3								~230
OVEM-14/20-...-GN-...				17.2	17.2	–	–							–
OVEM-14/20-...-GO-...						17.3								~230

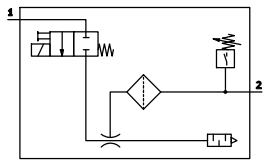
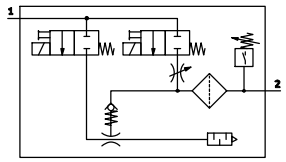
1) Thread for mounting on the common supply manifold ➔ 19
2) SD = Silencer

Vacuum generators OVEM

Technical data

FESTO

Ordering data and weight

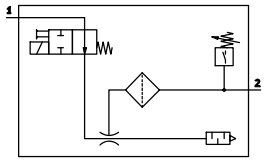
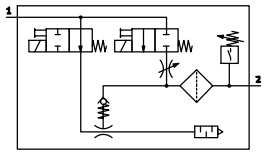
Circuit symbol	Description	Electrical switching output	Nominal width of laval nozzle [mm]	Weight [g]	Part No.	Type
NC – normally closed						
	P-V with QS fitting, R with open silencer	2x PNP	0.45	317	**538834**	**OVEM-05-H-B-QO-CN-N-2P**
			0.7	322	**538835**	**OVEM-07-H-B-QO-CN-N-2P**
			0.95		**538836**	**OVEM-10-H-B-QO-CN-N-2P**
			1.4	370	**539998**	**OVEM-14-H-B-QO-CN-N-2P**
	With ejector pulse, P-V with QS fitting, R with open silencer	2x PNP	0.45	325	**538831**	**OVEM-05-H-B-QO-CE-N-2P**
			0.7	330	**538832**	**OVEM-07-H-B-QO-CE-N-2P**
			0.95		**538833**	**OVEM-10-H-B-QO-CE-N-2P**
			1.4	380	**539997**	**OVEM-14-H-B-QO-CE-N-2P**
			2.0	390	**8023700**	**OVEM-20-H-B-QO-CE-N-2P**
		2x NPN	0.7	330	**540018**	**OVEM-07-H-B-QO-CE-N-2N**
			0.95		**540019**	**OVEM-10-H-B-QO-CE-N-2N**
			1.4	380	**540020**	**OVEM-14-H-B-QO-CE-N-2N**
		PNP	0.45	313	**540021**	**OVEM-05-H-B-QO-CE-N-1P**
			0.7	321	**540022**	**OVEM-07-H-B-QO-CE-N-1P**
			0.95		**540023**	**OVEM-10-H-B-QO-CE-N-1P**
			1.4	371	**540024**	**OVEM-14-H-B-QO-CE-N-1P**
			2.0	390	**8023699**	**OVEM-20-H-B-QO-CE-N-1P**
		IO-Link, 2x PNP in SIO mode	0.45	320	**8037693**	**OVEM-05-H-B-QO-CE-N-LK**
			0.7	330	**8037694**	**OVEM-07-H-B-QO-CE-N-LK**
			0.95		**8037695**	**OVEM-10-H-B-QO-CE-N-LK**
			1.4	380	**8037696**	**OVEM-14-H-B-QO-CE-N-LK**
	With ejector pulse, P-V with female thread, R with open silencer	2x PNP	0.7	335	**540015**	**OVEM-07-H-B-GO-CE-N-2P**
			0.95		**540016**	**OVEM-10-H-B-GO-CE-N-2P**
			1.4	385	**540017**	**OVEM-14-H-B-GO-CE-N-2P**
		2x NPN	0.7	335	**540012**	**OVEM-07-H-B-GO-CE-N-2N**
			0.95		**540013**	**OVEM-10-H-B-GO-CE-N-2N**
			1.4	385	**540014**	**OVEM-14-H-B-GO-CE-N-2N**
		PNP	0.45	302	**540025**	**OVEM-05-H-B-GO-CE-N-1P**
			0.7	325	**540026**	**OVEM-07-H-B-GO-CE-N-1P**
			0.95		**540027**	**OVEM-10-H-B-GO-CE-N-1P**
			1.4	375	**540028**	**OVEM-14-H-B-GO-CE-N-1P**
	With ejector pulse, prepared for common supply manifold, V with QS fitting, R with open silencer	2x PNP	2.0	415	**8023702**	**OVEM-20-H-B-PO-CE-N-2P**
		PNP	2.0		**8023701**	**OVEM-20-H-B-PO-CE-N-1P**

Vacuum generators OVEM

Technical data

FESTO

Ordering data and weight

Circuit symbol	Description	Electrical switching output	Nominal width of laval nozzle [mm]	Weight [g]	Part No.	Type
NO – normally open						
	P-V with QS fitting, R with open silencer	2x PNP	0.45	317	**538828**	**OVEM-05-H-B-QO-ON-N-2P**
			0.7	322	**538829**	**OVEM-07-H-B-QO-ON-N-2P**
			0.95		**538830**	**OVEM-10-H-B-QO-ON-N-2P**
			1.4	370	**539996**	**OVEM-14-H-B-QO-ON-N-2P**
	With ejector pulse, P-V with QS fitting, R with open silencer	2x PNP	0.45	325	**538825**	**OVEM-05-H-B-QO-OE-N-2P**
			0.7	331	**538826**	**OVEM-07-H-B-QO-OE-N-2P**
			0.95		**538827**	**OVEM-10-H-B-QO-OE-N-2P**
			1.4	380	**539995**	**OVEM-14-H-B-QO-OE-N-2P**
		2x NPN	0.7	331	**540009**	**OVEM-07-H-B-QO-OE-N-2N**
			0.95		**540010**	**OVEM-10-H-B-QO-OE-N-2N**
			1.4	380	**540011**	**OVEM-14-H-B-QO-OE-N-2N**
	With ejector pulse, P-V with female thread, R with open silencer	2x PNP	0.7	334	**540006**	**OVEM-07-H-B-GO-OE-N-2P**
			0.95		**540007**	**OVEM-10-H-B-GO-OE-N-2P**
			1.4	385	**540008**	**OVEM-14-H-B-GO-OE-N-2P**
		2x NPN	0.7	334	**540003**	**OVEM-07-H-B-GO-OE-N-2N**
			0.95		**540004**	**OVEM-10-H-B-GO-OE-N-2N**
			1.4	385	**540005**	**OVEM-14-H-B-GO-OE-N-2N**

Vacuum generators OVEM

Ordering data – Modular product system

FESTO

Ordering table

Size		20	Condi-tions	Code		Entry code
M	Module no.	**539074**				
	Vacuum generators	Vacuum generator with solenoid valve for vacuum valve on/off and manual override		**OVEM**		OVEM
	Nominal width of laval nozzle [mm]	0.45		**-05**		
		0.7		**-07**		
		0.95		**-10**		
		1.4		**-14**		
		2.0		**-20**		
	Ejector characteristic	High vacuum		**-H**		
		High suction rate	1	**-L**		
	Housing size/width [mm]	20		**-B**		-B
	Pneumatic connections	All connections with QS fittings		**-QS**		
		Supply/vacuum port with QS fittings, exhaust port with open silencer		**-QO**		
		All ports with G female thread		**-GN**		
		Supply / vacuum port with G female thread, exhaust port with open silencer		**-GO**		
		Prepared for supply manifold, vacuum port and exhaust port with QS fittings		**-PL**		
		Prepared for supply manifold, vacuum port with QS fittings, exhaust port with open silencer		**-PO**		
	Normal position of the vacuum generator	NO, normally open (vacuum generation)		**-ON**		
		NO, normally open (vacuum generation) with ejector pulse		**-OE**		
		NC, normally closed (no vacuum generation)		**-CN**		
		NC, normally closed (no vacuum generation) with ejector pulse		**-CE**		
	Electrical connection	Plug M12 (5-pin)		**-N**		-N
0	Vacuum sensor, (standard scale in bar)	Without vacuum sensor				
		1 switching output PNP		**-1P**		
		1 switching output NPN	1	**-1N**		
		2 switching outputs PNP		**-2P**		
		1 switching output PNP, 1 analogue output 0 ... 10 V		**-PU**		
		1 switching output PNP, 1 analogue output 4 ... 20 mA		**-PI**		
		2 switching outputs NPN		**-2N**		
		1 switching output NPN, 1 analogue output 0 ... 10 V	1	**-NU**		
		1 switching output NPN, 1 analogue output 4 ... 20 mA	1	**-NI**		
		IO-Link	2	**-LK**		
	Alternative vacuum display	InchHg	1	**-H**		

1 **L, 1N, NU, NI, H**
Not with laval nozzle of nominal size 2.0 mm.

2 **LK** Not with normal position of the vacuum generator ON and CN

Transfer order code

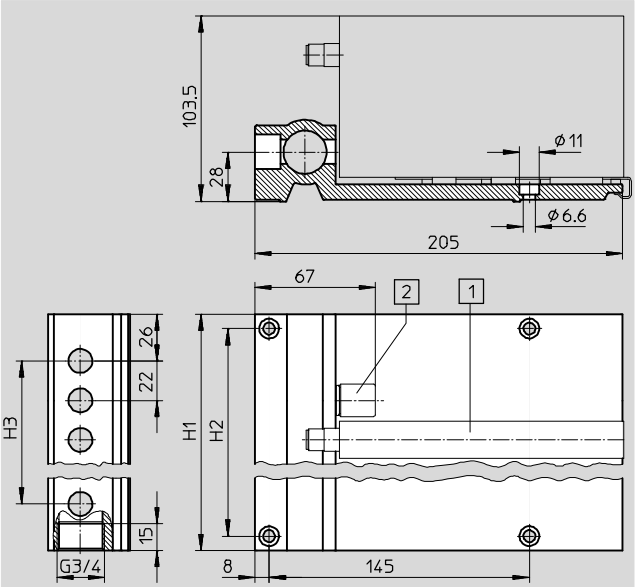
539074	OVEM	–		–		–	B	–		–		–	N	–		–	

Common supply manifold OABM-P
For vacuum generator
OVEM-...-PL/PO

Pneumatic connection 1: G¾
Type of mounting: with through-hole

Materials: Wrought aluminium alloy

Note on materials:
RoHS compliant



1 Vacuum generator
2 Blanking plug

Dimensions			
Number of device locations	H1	H2	H3
4	118	102	66
6	162	146	110
8	206	190	154

Tubing I.D. d_i as a function of total air consumption q_{nN}																	
Total air consumption [l/min]																	
50	75	154	175	225	310	400	480	500	750	890	1000	1190	1340	1850	2240	2300	2900
Tubing I.D.[1] [mm]																	
≥ 2.5	≥ 2.9	≥ 3.8	≥ 4	≥ 4.4	≥ 5	≥ 5.5	≥ 5.9	≥ 6	≥ 7	≥ 7.5	≥ 8	≥ 8.4	≥ 8.8	≥ 10	≥ 10.8	≥ 11	≥ 12
Recommended tubing														Technical data ➔ Internet: pun, pan			
PUN-4	PUN-6			PUN-8			PUN-10			PUN-12		PUN-16					PAN-16

1) With a tubing length of 3 m

- Note

The total air consumption of the fully equipped common supply manifold can be determined by adding the individual consumption of each generator used. Note that in the case of vacuum generators with ejector pulse (OE, CE), the individually set values for the ejector pulse (duration and intensity) can result in much higher air consumption.

Ordering data and weight					
	No. of device locations	CRC[1]	Weight [g]	Part No.	Type
Common supply	4	2	767	**549456**	**OABM-P-4**
	6	2	1045	**549457**	**OABM-P-6**
	8	2	1330	**549458**	**OABM-P-8**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Blanking plug OASC-G1-P
For common supply OABM-P-...

Type of mounting: threaded
Max. tightening torque: 10 Nm

Material:
Hollow bolt: Wrought aluminium alloy
Blanking cap: Steel
Seals: Steel, nitrile rubber
Note on materials:
RoHS compliant

Ordering data

	CRC[1]	Weight [g]	Part No.	Type
Blanking plug	2	53	**549460**	**OASC-G1-P**

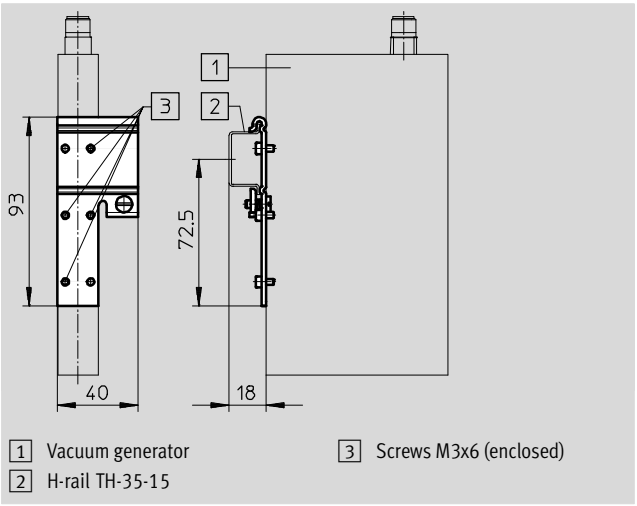
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

H-rail mounting
OABM-H
For vacuum generator OVEM

Max. tightening torque for H-rail mounting: 0.8 Nm

Material: Galvanised steel

Note on materials:
RoHS compliant

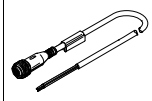
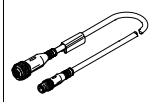
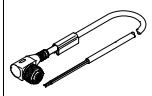


1 Vacuum generator
2 H-rail TH-35-15
3 Screws M3x6 (enclosed)

Ordering data

	Weight [g]	Part No.	Type
H-rail mounting	52	**549461**	**OABM-H**

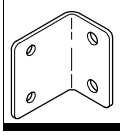
Ordering data – Connecting cable NEBU-M12 — Technical data ➔ Internet: nebu

	Electrical connection		Cable length [m]	Part No.	Type
	Straight socket, M12x1, 5-pin	Open end, 5-wire	2.5	**541330**	**NEBU-M12G5-K-2.5-LE5**
			5	**541331**	**NEBU-M12G5-K-5-LE5**
			10	**554038**	**NEBU-M12G5-K-10-LE5**
	Straight socket, M12x1, 5-pin	Straight plug, M8x1, 4-pin, rotatable thread	2.5	**554036**	**NEBU-M12G5-K-2.5-M8G4**
	Angled socket, M12x1, 5-pin	Open end, 5-wire	2.5	**567843**	**NEBU-M12W5-K-2.5-LE5**
			5	**567844**	**NEBU-M12W5-K-5-LE5**

Ordering data – Silencer extension UOMS — Technical data ➔ Internet: uoms

	Design	Type of mounting	Part No.	Type
	Open silencer	Engaging	**538436**	**UOMS-¼**

Ordering data – Mounting bracket HRM — Technical data ➔ Internet: hrm

	Material	Part No.	Type
	Galvanised steel	**9769**	**HRM-1**